

<b>FEE TRANSMITTAL</b> <b>for FY 2006</b> Patent fees are subject to annual revision. Effective December 8, 2004	<b>Complete if Known</b>	
	Application Number	09/914,966
	Confirmation Number	6640
	Filing Date	September 6, 2001
	First Named Inventor	Larry Neil Mackey
	Examiner Name	Cheryl Ann Juska
	Art Unit	1771
<b>TOTAL AMOUNT OF PAYMENT (\$500)</b>		Docket No. 7456R

**RECEIVED**  
**CENTRAL FAX CENTER**  
**OCT 06 2006**

<b>METHOD OF PAYMENT</b>		<b>FEE CALCULATION (continued)</b>																																					
1. <input checked="" type="checkbox"/> The Director is hereby authorized to charge indicated fees submitted on this form, credit any over payments, and charge any additional fee(s) during the pendency of this application to: Deposit Account Number: 16-2480 Deposit Account Name: The Procter & Gamble Company		5. <b>ADDITIONAL FEES</b> <table border="1"> <thead> <tr> <th>Fee Description</th> <th>Fee Paid</th> </tr> </thead> <tbody> <tr> <td>Extension for reply within 1<sup>st</sup> month</td> <td>(\$120) <input type="checkbox"/></td> </tr> <tr> <td>Extension for reply within 2<sup>nd</sup> month</td> <td>(\$450) <input type="checkbox"/></td> </tr> <tr> <td>Extension for reply within 3<sup>rd</sup> month</td> <td>(\$1,020) <input type="checkbox"/></td> </tr> <tr> <td>Extension for reply within 4<sup>th</sup> month</td> <td>(\$1,590) <input type="checkbox"/></td> </tr> <tr> <td>Extension for reply within 5<sup>th</sup> month</td> <td>(\$2,160) <input type="checkbox"/></td> </tr> <tr> <td>Information Disclosure Statement fee</td> <td>(\$180) <input type="checkbox"/></td> </tr> <tr> <td>37 CFR 1.16(f) Late Oath/Declaration (nonprovisional)</td> <td>(\$130) <input type="checkbox"/></td> </tr> <tr> <td>37 CFR 1.17 (q) Surcharge - Late provisional filing fee or cover sheet</td> <td>(\$50) <input type="checkbox"/></td> </tr> <tr> <td>Non-English specification</td> <td>(\$130) <input type="checkbox"/></td> </tr> <tr> <td>Notice of Appeal</td> <td>(\$500) <input type="checkbox"/></td> </tr> <tr> <td>Filing a brief in support of an appeal</td> <td>(\$500) <input checked="" type="checkbox"/></td> </tr> <tr> <td>Request for oral hearing</td> <td>(\$1,000) <input type="checkbox"/></td> </tr> <tr> <td>Acceptance of unintentionally delayed claim for priority under 35 U.S.C. 119, 120, 121, or 365 (a) or (c)</td> <td>(\$1,370) <input type="checkbox"/></td> </tr> <tr> <td>Other:</td> <td><input type="checkbox"/></td> </tr> </tbody> </table>		Fee Description	Fee Paid	Extension for reply within 1 <sup>st</sup> month	(\$120) <input type="checkbox"/>	Extension for reply within 2 <sup>nd</sup> month	(\$450) <input type="checkbox"/>	Extension for reply within 3 <sup>rd</sup> month	(\$1,020) <input type="checkbox"/>	Extension for reply within 4 <sup>th</sup> month	(\$1,590) <input type="checkbox"/>	Extension for reply within 5 <sup>th</sup> month	(\$2,160) <input type="checkbox"/>	Information Disclosure Statement fee	(\$180) <input type="checkbox"/>	37 CFR 1.16(f) Late Oath/Declaration (nonprovisional)	(\$130) <input type="checkbox"/>	37 CFR 1.17 (q) Surcharge - Late provisional filing fee or cover sheet	(\$50) <input type="checkbox"/>	Non-English specification	(\$130) <input type="checkbox"/>	Notice of Appeal	(\$500) <input type="checkbox"/>	Filing a brief in support of an appeal	(\$500) <input checked="" type="checkbox"/>	Request for oral hearing	(\$1,000) <input type="checkbox"/>	Acceptance of unintentionally delayed claim for priority under 35 U.S.C. 119, 120, 121, or 365 (a) or (c)	(\$1,370) <input type="checkbox"/>	Other:	<input type="checkbox"/>						
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3. <b>APPLICATION SIZE FEE:</b> Sheets of Spec and Drawings <input type="checkbox"/> (\$250 for each 50 sheets in excess of 100, except for sequence and program listings) SUBTOTAL (2)+(3) (\$) <input type="checkbox"/>																																							
4. <b>EXTRA CLAIM FEES FOR UTILITY AND REISSUE:</b> <table border="1"> <thead> <tr> <th></th> <th>Extra Claims</th> <th>Fee from Below</th> <th>Fee Paid</th> </tr> </thead> <tbody> <tr> <td>Total Claims <input type="checkbox"/> - 20** = <input type="checkbox"/> x</td> <td><input type="checkbox"/></td> <td>=</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Independent Claims <input type="checkbox"/> - 3** = <input type="checkbox"/> x</td> <td><input type="checkbox"/></td> <td>=</td> <td><input type="checkbox"/></td> </tr> <tr> <td>Multiple Dependent claims:</td> <td><input type="checkbox"/></td> <td>=</td> <td><input type="checkbox"/></td> </tr> </tbody> </table> ** or number previously paid, if greater. For Reissues, see below <b>Fee Description</b> Claims in excess of 20 (\$50 per claim) Independent claims in excess of 3 (\$200 per claim) Multiple dependent claim, if not paid (\$360) **Reissue: each independent claim over 3 and more than in the original patent (\$200 per claim) **Reissue claims: each claim over 20 and more than original patent (\$50 per claim) SUBTOTAL (4) (\$) <input type="checkbox"/>			Extra Claims	Fee from Below	Fee Paid	Total Claims <input type="checkbox"/> - 20** = <input type="checkbox"/> x	<input type="checkbox"/>	=	<input type="checkbox"/>	Independent Claims <input type="checkbox"/> - 3** = <input type="checkbox"/> x	<input type="checkbox"/>	=	<input type="checkbox"/>	Multiple Dependent claims:	<input type="checkbox"/>	=	<input type="checkbox"/>	SUBTOTAL(5) (\$) 500																					
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<b>SUBMITTED BY</b>		<b>Complete (if applicable)</b>	
Name (Print/Type)	C. Brant Cook	Registration No. (Attorney/Agent)	39,151
Signature	<i>C. Brant Cook</i>	Telephone	(513) 634-1533
		Date	October 6, 2006

+ This collection of information is required by 37 CFR 1.17. The information is required to obtain or retain a benefit by the public which is to file (and by the USPTO to process) an application. Confidentiality is governed by 35 U.S.C. 122 and 37 CFR 1.14. This collection is estimated to take 12 minutes to complete, including gathering, preparing, and submitting the completed application form to the USPTO. Time will vary depending upon individual case. Any comments on the amount of time you are required to complete this form and/or suggestions for reducing the burden, should be sent to the Chief Information Officer, U.S. Patent and Trademark Office, U.S. Department of Commerce, P. O. Box 1450, Alexandria, VA 22313-1450. DO NOT SEND FEES OR COMPLETED FORMS TO THIS ADDRESS. SEND TO: Commissioner for Patents, P.O. Box 1450, Alexandria, VA 22313-1450.

Fee Transmittal doc (Revised for P&G use 04/23/2006)

OCT 06 2006

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TO: MAIL STOP APPEAL BRIEF - PATENTS - United States Patent and Trademark Office  
EXAMINER CHERYL ANN JUSKA

Fax No. 571-273-8300

Phone No.

FROM: Connie Baker (Typed or printed name of person signing Certificate)

Fax No. 513-634-6312

Phone No. 513-634-0567

Application No.: 09/914,966

Inventor(s): Larry Neil Mackey, et al.

Filed: September 6, 2006

Docket No.: 7456R

Confirmation No.: 6640

FACSIMILE TRANSMITTAL SHEET ANDCERTIFICATE OF TRANSMISSION UNDER 37 C.F.R. §1.8

*I hereby certify that this correspondence is being facsimile transmitted to the United States Patent and Trademark Office on October 6, 2006, to the above-identified facsimile number.*

Connie Baker (Signature)

Listed below are the item(s) being submitted with this Certificate of Transmission:\*\*

- 1) Fee Transmittal
- 2) Appeal Brief (14 pages)
- 3)
- 4)

Number of Pages Including this Page: 16

Comments:

**\*\*Note:** Each paper must have its own certificate of transmission, OR this certificate must identify each submitted paper.

**RECEIVED  
CENTRAL FAX CENTER****OCT 06 2006****IN THE UNITED STATES PATENT AND TRADEMARK OFFICE**

Application No. : 09/914,966  
Applicant(s) : LARRY NEIL MACKEY et al.  
Filed : September 6, 2001  
Title : ABSORBENT FLEXIBLE STRUCTURE  
: COMPRISING STARCH FIBERS  
TC/A.U. : 1771  
Examiner : Cheryl Ann Juska  
Conf. No. : 6640  
Docket No. : 7456R  
Customer No. : 27752

**APPEAL BRIEF**

Mail Stop Appeal Brief - Patents

Commissioner for Patents

P. O. Box 1450

Alexandria, VA 22313-1450

Dear Sir,

This Brief is filed pursuant to the appeal from the U.S. Patent and Trademark Office decision of the Final Office Action mailed February 9, 2006. A timely Notice of Appeal was filed on April 25, 2006.

**REAL PARTY IN INTEREST**

The real party of interest is The Procter &amp; Gamble Company of Cincinnati, Ohio.

**RELATED APPEALS AND INTERFERENCES**

There are no known related appeals, interferences, or judicial proceedings.

**STATUS OF CLAIMS**

Claims 1-32 are cancelled.

Claims 33 to 52 are rejected.

Claims 33 to 52 are appealed.

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Atty. Docket No. 7456R  
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A complete copy of the appealed claims is set forth in the Claims Appendix attached herein.

#### STATUS OF AMENDMENTS

An Amendment After Final was filed on April 10, 2006. However, the Examiner did not enter the amendment per the Examiner's Advisory Action dated April 14, 2006.

#### SUMMARY OF CLAIMED SUBJECT MATTER

The present invention relates to fibers comprising starch (Page 5, lines 18-29; Figs. 7A and 7B) ("starch fibers"), wherein the fibers have an average fiber diameter of less than 10  $\mu\text{m}$  (Page 24, lines 10-14), to a fibrous structure (Page 9, lines 15-16) comprising a plurality of such starch fibers and to a paper product (Page 9, lines 10-12) comprising such a fibrous structure (Page 9, lines 15-16).

#### GROUND'S OF REJECTION TO BE REVIEWED ON APPEAL

Claims 33-35 and 37-52 stand finally rejected under 35 U.S.C. §103(a) over U.S. Patent No. 4,243,480 to Hernandez et al.

- i. Claims 33-35 and 37-49
- ii. Claim 50
- iii. Claim 51
- iv. Claim 52

Claim 36 stands finally rejected under 35 U.S.C. §103(a) over U.S. Patent No. 4,243,480 to Hernandez et al. in view of U.S. Patent No. 5,516,815 to Buehler et al.

- i. Claim 36

#### ARGUMENTS

Rejection Under 35 U.S.C. §103(a) over U.S. Patent No. 4,243,480 to Hernandez et al.

Claims 33-35 and 37-52 stand finally rejected under 35 U.S.C. §103(a) as defining obvious subject matter over U.S. Patent No. 4,243,480 to Hernandez et al. ("Hernandez"). The Examiner asserts that Hernandez teaches a starch fiber having a diameter of 10 to 500 microns.

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i. Claims 33-35 and 37-49

The Examiner asserts that Hernandez's teaching of starch fibers having a diameter of 10 to 500 microns (Hernandez, Col. 3, lines 58-64) renders Claim 33, an independent claim, and Claims 34-35 and 37-49, which ultimately depend from Claim 33, obvious.

Appellant respectfully submits that Claim 33 claims a fiber comprising starch, wherein the fiber has an average fiber diameter of less than 10 microns. Accordingly, Appellant respectfully disagrees with the Examiner's conclusion of obviousness.

Appellant respectfully submits that Hernandez fails to teach each and every element of Claim 33. Appellant submits that Hernandez teaches only one type of fiber spinning; namely, wet fiber spinning (solvent spun fibers). Hernandez teaches that its fibers are precipitated by extrusion of a thread-like stream of a colloidal dispersion of starch at 5-40%, by weight solids, into a suitable moving coagulating salt solution. (Hernandez, Col. 3, lines 58-64). One of ordinary skill in the art understands that as a result of the fiber spinning process taught by Hernandez, Hernandez's diameters for its fibers are relatively large (i.e., greater than 50 microns). There is no way that one of ordinary skill in the art could take Hernandez's teachings and produce fibers comprising starch, wherein the fibers have an average fiber diameter of less than 10 microns. The smallest average fiber diameter fiber that Hernandez explicitly teaches having made is a 65 micron average fiber diameter fiber. (Hernandez, Col. 12, lines 47-49). Appellant submits that in order to achieve less than 10 micron average fiber diameter fibers, the fibers need to be subjected to a significant force, such as an attenuation air stream (as shown and described in the present invention, Fig. 4), in order to reduce the average fiber diameter of the fiber being produced to less than 10 microns. The wet-spinning process taught by Hernandez does not apply a significant force that is capable of reducing the average fiber diameter of the fiber being produced to less than 10 microns. Hernandez doesn't even teach any process, such as mechanical drawing, that may aid in reducing its fibers' diameters. Hernandez only briefly mentions that the coagulating salt solution that its fibers are being produced in is moving. Therefore, Appellant respectfully submits that due to Hernandez's blatant failure to teach the need for or any process to attenuate (i.e., reduce the fibers' diameters) its fibers, one of ordinary skill in the art could not make fibers comprising starch, wherein the fibers have an average fiber diameter of less than 10

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microns based on Hernandez's teachings. Additional support for Appellant's position is found in the 37 CFR §1.132 Declaration by Larry Neil Mackey, an inventor of the claimed invention, attached hereto in the Evidence Appendix.

In addition to the deficiencies in Hernandez's teachings, Appellant respectfully submits that as described in Appellant's specification, its claimed fibers are made by a completely different process; namely, a dry-spinning process, such as a melt spinning process (Page 33, lines 25-26). Appellant's fibers are produced by extruding a starch composition through an extruder (10 of Fig. 4) to form fibers (12 of Fig. 4). The starch composition, extruded under pressure, is forced through a spinneret forming a vertically oriented curtain of downward advancing fibers (Page 33, lines 28-29; 12 of Fig. 4). The fibers (12 of Fig. 4) are quenched with air in conjunction with a suction-type drawing or attenuating air slot (22 of Fig. 4). The starch composition and the attenuation force described in the present invention facilitates the production of small average fiber diameter fibers (i.e., less than 10 microns).

In light of the foregoing, Appellant respectfully submits that Hernandez fails to teach each and every element of Claim 33 and therefore, fails to render Claim 33 obvious. MPEP 2143.03. At the very most, Hernandez merely teaches that it would have been obvious to try to make less than 10 micron average fiber diameter fiber. Further, Appellant respectfully submits that Claims 34-35 and 37-49, which ultimately depend from Claim 33, are not rendered obvious over Hernandez. MPEP 2143.03.

ii. Claim 50

Appellant respectfully submits that Hernandez fails to teach each and every element of Claim 50, which depends from Claim 33, because Hernandez fails to teach a melt blown fiber comprising starch. As discussed above, Hernandez teaches only one process, a wet-spinning process wherein fibers are precipitated into a coagulating salt solution. Further, Appellant submits that it is clear that fibers produced by Hernandez's wet-spinning process are different than those produced by Appellant's dry, melt spinning process. Further yet, Appellant submits that Claim 50, which depends from Claim 33, is not rendered obvious over Hernandez for the same reasons that Claim 33 is not rendered obvious over Hernandez. MPEP 2143.03.

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iii. Claim 51

Appellant respectfully submits that Hernandez fails to teach each and every element of Claim 51, which depends from Claim 33, because Hernandez fails to teach a spunbond fiber comprising starch. As discussed above, Hernandez teaches only one process, a wet-spinning process wherein fibers are precipitated into a coagulating salt solution. Further, Appellant submits that it is clear that fibers produced by Hernandez's wet-spinning process are different than those produced by Appellant's dry, spunbond process. Further yet, Appellant submits that Claim 51, which depends from Claim 33, is not rendered obvious over Hernandez for the same reasons that Claim 33 is not rendered obvious over Hernandez. MPEP 2143.03.

iv. Claim 52

Appellant respectfully submits that Hernandez fails to teach each and every element of Claim 52, an independent claim, because Hernandez fails to teach a paper product comprising a fibrous structure, wherein the fibrous structure comprises a fiber comprising starch, wherein the fiber has an average fiber diameter of less than 10 microns. For the reasons discussed above, Hernandez fails to teach a starch fiber having an average fiber diameter of less than 10 microns.

Rejection Under 35 U.S.C. §103(a) over U.S. Patent No. 4,243,480 to Hernandez et al. in view of U.S. Patent No. 5,516,815 to Buehler et al.

Claim 36 stands finally rejected under 35 U.S.C. §103(a) as defining obvious subject matter over U.S. Patent No. 4,243,480 to Hernandez et al. ("Hernandez") in view of U.S. Patent No. 5,516,815 to Buehler et al. ("Buehler"). The Examiner asserts that Hernandez teaches the addition of a plasticizer to its starch fiber, but fails to explicitly teach suitable plasticizers. The Examiner asserts that Buehler teaches a starch fiber having a plasticizer such as sorbitol, mannitol, ethylene glycol and polyethylene glycol. The Examiner concludes that it would have been obvious to one skilled in the art to employ the claimed plasticizers since Hernandez's lack of a teaching to suitable plasticizers must lead one to other prior art, such as Buehler.

Appellant respectfully disagrees with the Examiner's conclusion. Appellant respectfully submits that the combined teachings of Hernandez and Buehler fail to teach each and every element of Claim 36. Appellant submits that Hernandez, as discussed

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above, fails to teach a fiber comprising starch, wherein the fiber has an average fiber diameter of less than 10 microns. Further, Appellant submits that Buehler fails to overcome the deficiencies of Hernandez since it, like Hernandez, fails to teach a fiber comprising starch, wherein the fiber has an average fiber diameter of less than 10 microns. In addition, Appellant submits that Claim 36, which ultimately depends from Claim 33, is not rendered obvious over the teachings of Hernandez in view of Buehler for the same reasons that Claim 33 is not rendered obvious over the teachings of Hernandez, alone. MPEP 2143.03.

#### SUMMARY

In view of all of the above, it is respectfully submitted that Claims 33-52 are in condition for allowance.

Respectfully submitted,

THE PROCTER & GAMBLE COMPANY



Signature

C. Brant Cook

Registration No. 39,151

(513) 634-1533

Date: October 6, 2006  
Customer No. 27752



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### CLAIMS APPENDIX

Claim 33 A fiber comprising starch, wherein the fiber has an average fiber diameter of less than 10  $\mu\text{m}$ .

Claim 34 The fiber according to Claim 33 wherein the fiber comprises from about 20% to about 99.99% by weight of the fiber of starch.

Claim 35 The fiber according to Claim 33 wherein the fiber further comprises a plasticizer.

Claim 36 The fiber according to Claim 35 wherein the plasticizer selected from the group consisting of: sorbitol, monosaccharides, disaccharides, glycerol, polyvinyl alcohol, polyethylene glycol and mixtures thereof.

Claim 37 The fiber according to Claim 35 wherein the plasticizer is present in the fiber at a level of from about 5% to about 70% by weight of the fiber.

Claim 38 The fiber according to Claim 33 wherein the fiber further comprises a cross-linking agent.

Claim 39 The fiber according to Claim 38 wherein the cross-linking agent is selected from the group consisting of: polyamide-epichlorohydrin resins, urea-formaldehyde resins, glyoxylated polyacrylamide resins, melamine formaldehyde resins, polyethylenimine resins, dialdehyde starch resins and mixtures thereof.

Claim 40 The fiber according to Claim 38 wherein the cross-linking agent is present in the fiber at a level of from about 0.1% to about 10% by weight of the fiber.

Claim 41 A fibrous structure comprising a plurality of fibers, wherein at least one fiber is a fiber according to Claim 33.

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Claim 42 The fibrous structure according to Claim 41 wherein the fibrous structure has an absorbency ranging from about  $1 \frac{g_{\text{Water}}}{g_{\text{Dry Structure}}}$  to about  $15 \frac{g_{\text{Water}}}{g_{\text{Dry Structure}}}$ .

Claim 43 The fibrous structure according to Claim 41 wherein the fibrous structure has a total flexibility ranging from about 1.0 g/cm to about 75 g/cm.

Claim 44 The fibrous structure according to Claim 41 wherein the fibrous structure has a geometric mean dry tensile strength ranging from about 10 g/cm to about 1200 g/cm.

Claim 45 The fibrous structure according to Claim 41 wherein the fibrous structure has an initial geometric mean wet tensile strength ranging from about 2 g/cm to about 400 g/cm.

Claim 46 The fibrous structure according to Claim 45 wherein the fibrous structure has an initial geometric mean wet tensile strength ranging from about 2 g/cm to about 200 g/cm.

Claim 47 The fibrous structure according to Claim 41 wherein the fibrous structure has a geometric mean decayed wet tensile strength ranging from about 0 g/cm to about 20 g/cm.

Claim 48 The fibrous structure according to Claim 41 wherein the fibrous structure has a basis weight ranging from about 10 g/m<sup>2</sup> to about 450 g/m<sup>2</sup>.

Claim 49 The fibrous structure according to Claim 41 wherein the fibrous structure has an apparent density ranging from about 0.04 g/cm<sup>3</sup> to about 0.12 g/cm<sup>3</sup>.

Claims 50 The fiber according to Claim 33 wherein the fiber is a melt blown fiber.

Claim 51 The fiber according to Claim 33 wherein the fiber is a spunbond fiber.

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Claim 52 A paper product comprising a fibrous structure, wherein the fibrous structure comprises a fiber comprising starch, wherein the fiber has an average fiber diameter of less than 10  $\mu\text{m}$ .

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## EVIDENCE APPENDIX

This Evidence Appendix contains a copy of a 37 CFR §1.132 Declaration that was submitted by the Applicants during prosecution of the appealed application on December 7, 2005 and entry of such Declaration was evidenced in the Examiner's February 9, 2006 Office Action.

### IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Application No.	: 09/914,966
Applicant(s)	: LARRY NEIL MACKEY et al.
Filed	: September 6, 2001
Title	: ABSORBENT FLEXIBLE STRUCTURE : COMPRISING STARCH FIBERS
TC/A.U.	: 1771
Examiner	: Cheryl Ann Juska
Conf. No.	: 6640
Docket No.	: 7456R
Customer No.	: 27752

### DECLARATION UNDER 37 CFR 1.132

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Commissioner for Patents  
P.O. Box 1450  
Alexandria, VA 22213-1450

Dear Sir:

I, Larry Neil Mackey, hereby declare the following:

1. THAT, I am a named-inventor of the above-identified patent application;
2. THAT, I received a Ph.D. in Analytical Chemistry from The Ohio State University in 1975 and have been employed by The Procter & Gamble Company, as a

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Research Fellow assigned primarily to Procter & Gamble's starch fiber project, the subject of the present application, since 1998.

3. I am familiar with U.S. Patent No. 4,243,480 to Hernandez et al. ("Hernandez"). I have thoroughly reviewed Hernandez and it is my technical opinion that Hernandez fails to adequately teach fibers comprising starch, wherein the fibers have an average fiber diameter of less than 10  $\mu\text{m}$ .

As is recognized by the Examiner, Hernandez teaches solvent spun fibers. Further, Hernandez explicitly describes obtaining its fibers via precipitation of a colloidal dispersion of starch in a coagulating salt solution. Hernandez, Col. 2, lines 24-32; Col. 3, lines 58-64.

Hernandez only teaches making one diameter of starch fiber; namely, a fiber having an average fiber diameter of 65  $\mu\text{m}$ . Hernandez, Col 12, lines 39-49. Nowhere does Hernandez even attempt to teach making a starch fiber having an average fiber diameter of 10  $\mu\text{m}$ . At the very most, Hernandez merely mentions that "the only requirement [of its fibers] being that the waterinsensitive [sic] fibers have a diameter of 10 to 500 microns." Hernandez, Col. 3, lines 59-61. Hernandez never explicitly teaches or enables one of ordinary skill in the art how to make a starch fiber having a fiber diameter of less than 10  $\mu\text{m}$  using its solvent spinning process. In light of the foregoing, at the very most, Hernandez's brief mentioning of "requirements" of its fibers merely suggests to one of ordinary skill in the art to try making a fiber having a fiber diameter of 10 microns. Hernandez provides no reasonable expectation of success that a starch fiber having a fiber diameter of 10 microns can be made by its solvent spinning process.

It is well known that the diameter of a spun fiber is essentially equivalent to the diameter of the extrusion die through which the spun fiber is formed unless the spun fiber is subjected to extremely high attenuation forces. In other words, as is shown in Hernandez's Example 1, a 65 micron diameter fiber is formed by passing a dispersion of starch through 70.2 micron diameter apertures within a die. Accordingly, based on Hernandez's teachings, in order to produce 10 micron diameter fibers, one would have to pass a starch dispersion through about a 10 micron diameter aperture. This is not feasible since starch dispersions typically contain from 3-20 micron granules that would clog a 10 micron diameter aperture.

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As a result, I and my colleagues unexpectedly found that extremely high attenuation forces need to be applied to a spun starch fiber in order to obtain less than 10 micron diameter fibers. In one example we use about a 300 micron diameter extrusion die that would produce about 300 micron diameter fibers UNLESS extremely high attenuation forces are applied to the fiber. Since we subject the fiber to extremely high attenuation forces, our final fiber diameter is less than 10 microns. Hernandez does not teach significantly attenuating its fiber after exiting the die. The final diameter of a spun fiber is related to the elongation needed (attenuation facilitates elongation of the fiber). More particularly, for example, in order to obtain a 10  $\mu\text{m}$  fiber from a starch composition that exits a 70  $\mu\text{m}$  aperture in a die (as described in Hernandez's Example 1), the elongation required is equal to  $(70 \mu\text{m})^2 / (10 \mu\text{m})^2$ . However, Hernandez fails to mention, even in passing, the need to elongate and/or attenuate its fibers after they exit the die.

I, being one of at least ordinary, if not above ordinary skill in the art of starch fiber spinning, am not able to use the teachings of Hernandez to make a starch fiber having a fiber diameter of 10 microns. Therefore, it is my technical opinion that Hernandez falls well short of adequately describing and teaching how to make a starch fiber having a fiber diameter of 10 microns. Apparently, Hernandez only teaches how to make a starch fiber having an average fiber diameter of 65 microns. Hernandez, Col. 12, Example 1.

4. I am familiar with U.S. Patent No. 5,516,815 to Buehler et al. ("Buehler"). I have thoroughly reviewed Buehler and it is my technical opinion that Buehler fails to remedy the deficiencies associated with Hernandez, discussed above.

5. With regard to the claimed invention of the above-named application, I submit that I and my co-inventors have unexpectedly found that starch fibers having an average diameter of less than 10  $\mu\text{m}$  can be produced via melt spinning and/or spunbond processes so long as significant amounts of attenuation air are applied to the fibers after exiting the dies in order to elongate the fibers to a final average fiber diameter of less than 10  $\mu\text{m}$ . Before our discovery and invention, no one had ever been able to spin starch fibers having an average fiber diameter of less than 10  $\mu\text{m}$ .

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I, Larry Neil Mackey, declare all statements made herein are true to the best of my knowledge, or if made upon information and belief, are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

Further Declarant sayeth not.

Larry Neil Mackey  
Larry Neil Mackey  
Date: 12-07-05

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# RELATED PROCEEDINGS APPENDIX

None